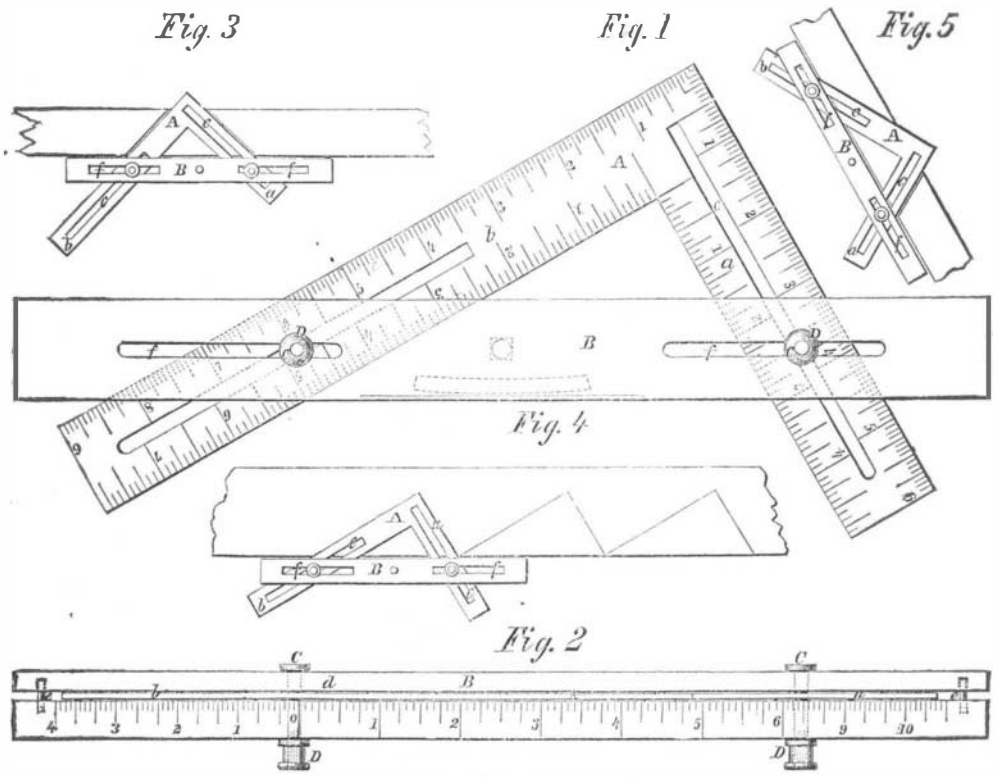
Improved Pitch Square.

It is only by long experience, and by having the attention directed to the subject, that any person, either performing work or having the direction ofit, is able to appreciate the large proportion of time consumed in planning, measuring, and laying out. Instruments, therefore, which indicate the exact position for a cut or a hole, are valuable, not only from securing a greater accuracy in the work, but also from the saving of time which results from their use.

The accompanying engravings represent a simple implement for carpenters' and joiners' use, intended to facilitate the cutting of rafters, the laying out of stairs and many other operations. It consists merely in the combination of a carpenters' square with a graduated straight edge.

Fig. 1 is a flat view of the implement and Fig. 2 a view edgewise. A is a carpenters' square made of metal in the ordinary form with the outer edges graduated in inches and sixteenths, and the inner edges in inches and twelfths. The straight edge or stock, B, is in two parts, one upon each side of the square as shown in Fig. 2. These two parts of the stock are drawn together —grasping the square— by means of the bolts, C C, which are provided with nuts, D, having milled heads; dowel pins, *e e*, keep the parts in position. The bolts, C, pass through long slots, *c c*, in the square and *f f*, in the stock, allowing the relative position of those two piece to be varied.

The outer edge of the stock is graduated in inches as shown in Fig. 2, the inches from ● to 6 inclusive being subdivided into twelfths, and at each side of these points into sixteenths.



ISEMAN'S PITCH SQUARE.

It would be impossible to give directions for the use of this implement in the great number of cases in which it may be employed, but a few of the more important will be sufficient to suggest the others as occasions arise. If it is desired to obtain the length of a rafter for a roof of which the span is 32 feet and the perpendicular hight 16 feet; let one-fourth of an inch on the scale represent a foot in the roof; set the short arm of the square with the fourth inch—equal to 16 quarters of an inch for the 16 feet perpendicular hight—even with the side of the stock; and bring the fourth division on the longer arm of the square—equal to 16 feet, one-half of the span—even with zero on the stock; then will the space on the stock between the two arms of the square represent the length of the rafter, and this space may be read off on the scale of the stock where this scale is cut by the short arm of the square.

When the implement is thus adjusted to determine the length of a rafter, the shorter arm, *a*, will give the bevel for the upper end, and the longer arm, *b*, of the foot, as shown in Fig. 5.

Fig. 3 illustrates the mode of adjusting the implement to be used as a miter, and Fig. 4 shows the manner in which it may be used for laying out stairs; one limb giving the angle for the treads and the other for the rises.

The patent for this invention was granted, through the Scientific American Patent Agency, May 6, 1862, and for the purchase of either the whole patent or territorial rights, or for any further information in relation to the matter, inquiries may be addressed to the inventor, John Iseman, at Rosston, Pa. [See advertisement in our next number.]

LARGE numbers of steam engines upon the plan of G. H. Corliss, of Providence, R. I., are now made in Silesia, Prussia, and two of them are shown in the London Exhibition.

The Power of Sea Waves.

The following interesting extracts are from an article in the last number of the *North British Review* on the "Geological Changes in Scotland in Historic Times":—

Of all the agents of change that have modified the surface of the land, none arrest the attention more than the waves of the sea. One cannot witness the effects of a storm on an exposed coast without being impressed with the enormous amount of wear and tear which is there visible.

No written records of changes effected by the sea in Scotland go further back than four hundred years. It would be interesting if we could trace the gradual retreat of the coast line for the past two thousand years. The force with which the waves of the German ocean fall on objects opposed to their fury has been measured with great care at the Bell Rock Lighthouse. This massive structure, rising 112 feet above the sea level, is literally buried in foam and spray during ground swells when there is no wind. Experiments were made from the middle of September 1844 to the end of March 1845 when the greatest pressure of the waves was found to be 3,013 lbs. on the square foot. When this lighthouse was building in 1807, a storm came on and six large blocks of granite, which had been landed on the reef, were thrown over the ledge to a distance of fifteen yards, and an anchor weighing nearly one tun was lifted out of the sea by the waves and thrown upon the rock. Stone measuring upward of 30 cubic feet and weighing two tuns are frequently lifted from deep water and thrown upon the Bell Rock during storms. The lighthouse keepers call these boulders "sea travelers." The sea at a distance of 100 yards around the Bell Rock reef is three fathoms deep. The breakers in the north sea beating around the Shetland Isles, sometimes tear up masses of rock in the island of Whalsey, weighing 8½ tuns, and these are frequently left heaped in a pile 62 feet high above tide-water mark. Rocks ranging in weight from 6 to 13½ tuns have been quarried by the waves in a storm from their positions in *situ* at levels from 70 to 74 feet above the common level of the sea. One block of 7 $\frac{7}{10}$ tuns weight situated at 20 feet above the sea level has been lifted from its bed and transported a distance of 73 feet, and in its progress it has been lifted over abrupt faces seven feet in hight.

On the west side of the Shetland islands, the violence of the Atlantic has produced scenes of devastation of which it is difficult to convey in words an adequate representation. We see the process going on still with a rapidity and magnitude which cannot but fill the observer with astonishment. In stormy winters huge blocks of stone are overturned and removed from their native beds to a distance almost incredible. In 1802 a tabular mass of rock 8 feet 2 inches, by 7 feet, and 5 feet in thickness, was removed to a distance of 90 feet by the sea in one of the islands. During the progress of erecting a lighthouse on Skerryvore rock—which lies on the west coast of Scotland, exposed to the full fury of the Atlantic, without a ridge of land between it and America—the pressure of the waves was measured in 1843 and 1844 and 1845 by Mr. A. Stevenson, the engineer. During a heavy gale in March, 1845, the pressure was 6,083 lbs. on the square foot. In winter the average pressure is 2,086 lbs. on the square foot, in summer it is only 611 lbs. Thus the greatest pressure is nearly three tuns on the foot—a force which is terrific in its destructive effects.

Polishing Metals.

A patent has been taken out by W. Clark, of London, for the following composition, which he calls brillantine—to be used as a polishing powder for metals: First, an extract of guano is obtained by boiling that substance in water until a concentrated crystalline mass is formed on cooling. Of this extract he takes 100 parts, by weight; 25 parts of calcined tripoli; 12 parts of wheaten flour, and common salt 10 parts; these are all mixed together in a vessel over a moderate fire until a homogeneous paste is formed, which is allowed to cool and harden. It is then reduced to fine powder, and is used for polishing metals and cleaning glass by mixing it with dilute alcohol or any alcohol spirits. It is said to form a very superior polishing powder. The crystallized urates obtained from the extract of guano possess great efficiency in acting upon hard metallic surfaces.

PETROLEUM FOR FUEL.

A few years since—Dec. 24, 1859, page 415, Vol. I. (new series) SCIENTIFIC AMERICAN—we suggested the employment of crude coal oil as a fuel for steamers. At that period we stated that crude coal oil could be obtained at ten cents per gallon, and that one hundred gallons of it were equal to one tun of coal for raising steam. The method we proposed for the burning of the oil was to convey it from elevated tanks in tubes, and allow it to pass through minute perforations in blocks of fire brick or soapstone, in the furnace under the boilers. The great subterranean repositories of petroleum in Western Pennsylvania and Canada, were not then discovered; and if the reasons we then advanced for the employment of such oil as fuel were sound, they are far more so now, on account of the unlimited quantities of earth oil that can now be obtained at very low prices. The following, from the Pittsburgh *Daily Chronicle*, shows that a beginning has been successfully made to employ liquid fuel in the manner we had suggested:

It is stated that the firm of Clark, Rust & Walker, proprietors of an oil refinery in Erie county, are now using naphtha, or benzine, as a substitute for coal in heating their furnaces. The naphtha is introduced into the furnaces by means of pipes, constantly feeding the fire by a gentle flow, and keeping it up to any heat that may be desired. It saves the labor of two men, and also the cost of about eighteen dollars' worth of coal per week, making an aggregate in reduced expenses of some thirty dollars. There being no demand for naphtha, it has accumulated on their hands, and they are, of course, gratified at the discovery of a means of disposing of it in the prosecution of their regular business.

THE business at Windsor Locks, Conn., which had been much depressed by the war, is beginning to revive and flourish. The paper makers and sewing silk manufacturers in this place are now doing a good business.